UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,910	12/14/2001	Yongwon Choi	600-1-200 DIV CON	7510

28977 7590 12/30/2004

MORGAN, LEWIS & BOCKIUS LLP
1701 MARKET STREET
PHILADELPHIA, PA 19103-2921

EXAMINER	
ROMEO, DAVID S	

ART UNIT	PAPER NUMBER
1647	

DATE MAILED: 12/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,910	CHOI ET AL.	
	Examiner	Art Unit	
	David S Romeo	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-15 and 60-66* is/are pending in the application.

4a) Of the above claim(s) *12,13 and 65* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10,11,14,15 and 60-65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *10-15 and 60-66* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 10-15 and 60-66 are pending.

Applicant's election without traverse of group I, claim 65, in the reply filed on 10/14/2004 is acknowledged.

Claim 66 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/14/2004.

Applicant's election with traverse of the monoclonal antibody species and the alkaline phosphatase species in the reply filed on 10/14/2004 is acknowledged. The traversal is on the following ground(s):

the five species of antibodies are sufficiently related such that a search of the term "antibody" would be able to identify any of these five species;

that the five species of antibodies are so few in number that searching all five would not impose an undue burden;

that the species of detectable label are so few in number that searching all would not impose an undue burden;

that the examiner has not provided reasons and/or examples to support conclusions with regard to the species election;

that the examiner has not provided reasons why the five species of antibodies are structurally distinct and why such species are unrelated; and,

that the antibody species share a common utility and share a substantial structural feature that is associated to that utility.

This is not found persuasive because:

There is a lack of unity amongst the species, as evidenced by the prior art rejections in the present Office action. Furthermore, a polyclonal antibody, chimeric antibody, single chain antibody, or Fab fragment would not be rejected solely over a piece of prior art disclosing a monoclonal antibody. A chimeric antibody, single chain antibody, Fab fragment, or monoclonal antibody would not be rejected solely over a piece of prior art disclosing a polyclonal antibody. A single chain antibody, Fab fragment, monoclonal antibody, or a polyclonal antibody would not be rejected solely over a piece of prior art disclosing a chimeric antibody. A Fab fragment, monoclonal antibody, polyclonal antibody, or a chimeric antibody would not be rejected solely over a piece of prior art disclosing a single chain antibody. A monoclonal antibody, polyclonal antibody, a chimeric antibody, or a single chain antibody would not be rejected solely over a piece of prior art disclosing a Fab fragment. Thus, the searches for each of these species are not co-extensive and each of the species requires a separate search. Similarly, an alkaline phosphatase or peroxidase detectable label would not be rejected solely over a piece of prior art disclosing a radioactive isotope label. A peroxidase or radioactive isotope detectable label would not be rejected solely over a piece of prior art disclosing an alkaline phosphatase label. A radioactive isotope or alkaline phosphatase detectable label would not be rejected solely over a piece of prior art disclosing a peroxidase label. Thus, the searches for each of these species are not co-extensive and each of the species requires a separate search. Applicant has provided no evidence that the species of

detectable label share a substantial structural feature disclosed as being essential to their utility. In addition, for each of the five species of antibody there are potentially three species of detectable label, which makes a potential of fifteen separate species. Fifteen species is not sufficiently few in number.

The requirement is still deemed proper and is therefore made FINAL.

Claims 12, 13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 10/14/2004.

How the examiner construes the claims:

The limitation "having as an immunogen ..." is construed as a process limitation. The recitation of a process limitation in the claims is not viewed as positively limiting the claimed antibody absent a showing that the process imparts a novel or unexpected property to the claimed antibody, as it is assumed that equivalent products are obtainable by multiple routes. Furthermore, the claimed antibodies, other than the ones claimed in claims 65 and 66, encompass any and/or all antibodies obtained after an immunization procedure with the recited polypeptides, whether or not the claimed antibodies bind the immunogen. The burden is upon the applicants to establish a patentable distinction between the claimed antibody and any referenced prior art antibody.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 10, 11, 14, 15, 60-65 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Circulating anti-cytokine natural Abs are generally present in the sera of healthy individuals, although at low levels. See Zagury (U), page 8025, right column, full paragraph 2. Radioisotopes, generally, and ^{14}C, particularly, are labeling compounds, occur in nature, and are incorporated into proteins. See Ferry (A, U. S. Patent No. 5,534,699), column 1, full paragraph 2. Therefore, claims 10, 11, 14, 15, 60-65, as written, do not sufficiently distinguish over antibodies as they exist naturally because the claims do not particularly point out any non-naturally occurring differences between the claimed products and the naturally occurring products. In the absence of the hand of man, the naturally occurring products are considered non-statutory subject matter. See Diamond v. Chakrabarty, 447 U.S. 303, 206 USPQ 193 (1980). The claims should be amended to indicate the hand of the inventor, e.g., by insertion of "Isolated" or "Purified." See MPEP 2105.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10, 11, 14, 15, 60-62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10, 11, 14, 15, 60-62 are indefinite over the recitation of "immunogen a polypeptide comprising an amino acid sequence ... the amino acid sequence set forth in SEQ ID NO: 4" because it is unclear how to construe the immunogen. For example, it is unclear if the immunogen is a polypeptide comprising a fragment of an amino acid sequence selected from the group consisting of SEQ ID NO: 2 and SEQ ID NO: 4, or if the immunogen is a fragment of an amino acid sequence selected from the group consisting of SEQ ID NO: 2 and SEQ ID NO: 4. This is not meant to be an exhaustive list of all the ambiguities conveyed by the claim language and all the embodiments ("polypeptide comprising an amino acid sequence," a conserved variant," "a fragment," "an analog," and "a derivative thereof") of the immunogen. A response by applicant that only addresses the ambiguities conveyed by the claim language directed to a "fragment," as discussed above, and that does not address any of the ambiguities conveyed by the claim language and any of the other embodiments will not overcome the rejection. These same grounds of rejection are applied to the recitation of "polypeptide comprising an amino acid sequence set forth in SEQ ID NO: 2, ... , or a derivative thereof" (claims 60, 61) for the same reasons. The metes and bounds are not clearly set forth. Solely with respect to the issues raised in this rejection and solely for the sake of illustration, the metes and bounds of the following would be clear: said immunogen is a polypeptide selected from the group consisting of a polypeptide comprising the amino acid sequence

of SEQ ID NO: 2, a polypeptide comprising the amino acid sequence of a conserved variant of SEQ ID NO: 2, a polypeptide comprising the amino acid sequence of a fragment of SEQ ID NO: 2, a polypeptide comprising the amino acid sequence of an analog of SEQ ID NO: 2, and a polypeptide comprising the amino acid sequence of a derivative of SEQ ID NO: 2.

Claims 10, 11, 14, 15, 60-62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10, 11, 14, 15, 60-62 are indefinite because they recite the terms "conserved variant," "analog," and "derivative." Because the instant specification does not identify that material element or combination of elements which is unique to, and, therefore, definitive of "conserved variant," "analog," and "derivative" an artisan cannot determine what additional or material limitations are placed upon a claim by the presence of these elements. The metes and bounds are not clearly set forth.

Claims 10, 11, 14, 15, 60-62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are directed to an antibody produced by a process, as discussed above. The claims do not require that the antibody have any particular binding specificity or capacity. In an immunization process it is reasonable to expect to obtain both antibodies

that bind the immunogen and antibodies that do not bind the immunogen. See Yokoyama (Y), page 2.5.8, "The vast majority of the wells will not contain the desired antibody". It is unclear if the claimed antibodies bind the immunogen. The metes and bounds are not clearly set forth.

Claim 65 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "wherein said antibody is specific for a single form of TRANCE, wherein said TRANCE is human TRANCE having the amino acid sequence as set forth in SEQ ID NO: 2" (claim 65) can be rewritten as "wherein said antibody is specific for a single form of human TRANCE having the amino acid sequence as set forth in SEQ ID NO: 2." The specification originally disclosed:

> The antibodies of the invention may be cross reactive, e.g., they may recognize TRANCE from different species. ... Alternatively, an antibody of the invention may be specific for a single form of TRANCE, such as human TRANCE having an amino acid sequence as set forth in FIG. 2 (SEQ ID NO:2), or murine TRANCE, having an amino acid sequence as set forth in FIG. 4 (SEQ ID NO:4). Paragraph bridging pages 45-46.

> For selection of an antibody specific to a TRANCE polypeptide from a particular species of animal, one can select on the basis of positive binding with TRANCE polypeptide expressed by or isolated from T cells of that species of animal, and negative binding with TRANCE from other species. Page 48, first paragraph.

The embodiments originally disclosed in the specification do not correspond in scope to the apparent scope of newly added claim 65. On one hand, the specification

describes antibodies that bind to TRANCE from one organism but do not bind to TRANCE from any other organism. On the other hand, claim 65 would appear to encompass only antibodies that bind to only one form of human TRANCE (SEQ ID NO: 2) but not to any other form of human TRANCE. However, the claimed antibodies do not exclude binding to other forms of TRANCE from other organisms as long as they bind to human TRANCE (SEQ ID NO: 2) but not to any other form of human TRANCE. When read in light of the specification, it is unclear if the claimed antibodies only bind to human TRANCE (SEQ ID NO: 2) but not to any other form of TRANCE from any organism or if the claimed antibodies only bind to human TRANCE (SEQ ID NO: 2) but not to any other form of human TRANCE and the antibodies may bind to other forms of TRANCE from other organisms as long as they only bind to human TRANCE (SEQ ID NO: 2) but not to any other form of human TRANCE. The metes and bounds are not clearly set forth.

Claims 10, 11, 14, 15, 60-62 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are directed to or encompass a genus of antibodies that bind a genus of immunogens comprising an analog, derivative, conserved variant, or fragment of SEQ ID NO: 2 or SEQ ID NO: 4. There are no structural or functional limitations to the analogs, derivatives, or conserved variants. A single amino acid is a "fragment" of SEQ ID NO: 2

or SEQ ID NO: 4. Hence, the claims also encompass a genus of antibodies that bind to a genus of immunogens comprising but a single amino acid of SEQ ID NO: 2 or SEQ ID NO: 4. To determine whether there is correspondence between the generic invention of the claims and the written description, it is necessary to determine whether the description conveys to one skilled in the relevant art that applicant was in possession of the claimed genus at the time the application was filed. To this end, it is appropriate to inquire whether a number of species representative of the genus are described in complete structural terms or, alternatively, with reference to other identifying characteristics, e.g., partial structure, chemical properties, functional properties, etc. What constitutes a "representative number" of species for any given genus depends in part on whether the level of skill in the art, the teachings in the disclosure, or teachings in the prior art establish predictability as to the structural properties characteristic of the genus.

The claims embrace a genus of antibodies that bind immunogens having little or no structural similarity to the exemplified polypeptides SEQ ID NO: 2 and SEQ ID NO: 4 because there are no structural or functional limitations to the analog, derivative, fragment, conserved variant. The specification and claim do not indicate what distinguishing attributes are shared by the genus of variant immunogens. The specification and claim do not place any limit on the number of amino acid substitutions, deletions, insertions and/or additions that may be made to SEQ ID NO: 2 or SEQ ID NO: 4. Thus, the scope of the claims includes numerous antibodies that bind numerous variant immunogens, and the claimed genus of antibodies is highly variant because a significant number of structural differences between the immunogens is permitted. The

specification and claim do not provide any guidance as to what changes should be made to the immunogen. Structural features that could distinguish immunogens in the genus from others in the protein class are missing from the disclosure. No common structural attributes identify the members of the genus of variant immunogens. The general knowledge and level of skill in the art do not supplement the omitted description because specific, not general, guidance is what is needed. Since the disclosure fails to describe the common attributes or characteristics that identify members of the genus of variant immunogens, and because the genus is highly variant, antibodies that bind SEQ ID NO: 2 or SEQ ID NO: 4 are insufficient to describe the genus. One of skill in the art would reasonably conclude that the disclosure fails to provide a representative number of species to describe the genus. Thus, applicant was not in possession of the claimed genus.

Claim 65 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claim is directed to or encompasses "human TRANCE having the amino acid sequence as set forth in SEQ ID NO: 2." SEQ ID NO: 2 is a partial sequence of a full-length polypeptide. The term "human TRANCE" encompasses the full-length polypeptide. However, the present specification does not describe the full-length human TRANCE. The disclosure of SEQ ID NO: 2 cannot be said to fairly describe a full-

length polypeptide. At best it might be obvious to the skilled artisan that it would be desirable to employ such a the presently disclosed materials in attempt to obtain a full-length human TRANCE. However, the written description does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed. It extends only to that which is disclosed. One shows that one is in possession of the invention by describing the invention, with all its claimed limitations, not that which makes it obvious. The present specification does not provide a written description of the corresponding full length polynucleotides and polypeptides. The present specification conveys no distinguishing information concerning the missing sequence that constitutes the full length compounds. Describing a method of isolating or preparing the full length compounds does not describe the full length molecules. While it may be obvious to obtain the full length molecules, a description which renders the full length molecules obvious is not sufficient to satisfy the written description requirement. The skilled artisan cannot envision the detailed chemical structure of the encompassed full length compounds and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it. One cannot describe what one has not conceived. Therefore, only antibodies that bind a polypeptide consisting of the amino acid sequence of SEQ ID NO: 2, but not the full breadth of the claim, meets the written description provision of 35 U.S.C. 112, first paragraph.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 10, 11, 60-64 are rejected under 35 U.S.C. 102(e) as being anticipated by Anderson (A) (U. S. Patent No. 6,017,729). This rejection is based upon a priority date of 10/14/1997 for Anderson obtained via provisional application no. 60/064,671 or a priority date of 03/07/1997 obtained via provisional application no. 60/077,181.

Anderson discloses (Example 8) human Receptor activator of nuclear factor kappa B ligand (RANKL) (*also know as* human tumor necrosis factor ligand superfamily member 11, TNFSF11, TNF-related activation-induced cytokine, TRANCE, Osteoprotegrin ligand, OPGL, and Osteoclast differentiation factor, ODF), which is 99.5% identical to the present application's SEQ ID NO: 2, as indicated below (Qy = the present application's SEQ ID NO: 2) (Db = human RANKL):

```
;  INFORMATION FOR SEQ ID NO:  13:
;    SEQUENCE CHARACTERISTICS:
;      LENGTH:  317 amino acids
;      TYPE:  amino acid
;      TOPOLOGY:  linear
;    MOLECULE TYPE:  protein
US-08-996-139-13

  Query Match             99.5%;  Score 1293;  DB 3;  Length 317;
  Best Local Similarity   99.6%;  Pred. No. 1.3e-137;
  Matches  244;  Conservative    0;  Mismatches    1;  Indels    0;  Gaps    0;

Qy          1 QMDPNRISEDGTHCIYRILRLHENADFQDTTLESQDTKLIPDSCRRIKQAFQGAVQKELQ 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         73 QMDPNRISEDGTHCIYRILRLHENADFQDTTLESQDTKLIPDSCRRIKQAFQGAVQKELQ 132

Qy         61 HIVGSQHIRAEKAMVDGSWLDLAKRSKLEAQPFAHLTINATDIPSGSHKVSLSSWYHDRG 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
```

```
Db        133 HIVGSQHIRAEKAMVDGSWLDLAKRSKLEAQPFAHLTINATDIPSGSHKVSLSSWYHDRG 192

Qy        121 WGKISNMTFSNGKLIVNQDGFYYLYANICFRHHETSGDLATEYLQLMVYVTKTSIKIPSS 180
              | ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        193 WAKISNMTFSNGKLIVNQDGFYYLYANICFRHHETSGDLATEYLQLMVYVTKTSIKIPSS 252

Qy        181 HTLMKGGSTKYWSGNSEFHFYSINVGGFFKLRSGEEISIEVSNPSLLDPDQDATYFGAFK 240
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        253 HTLMKGGSTKYWSGNSEFHFYSINVGGFFKLRSGEEISIEVSNPSLLDPDQDATYFGAFK 312

Qy        241 VRDID 245
              |||||
Db        313 VRDID 317
```

Anderson also discloses (Example 7) mouse RANKL, which is 92.8% identical to the present application's SEQ ID NO: 4, as indicated below (Qy = the present application's SEQ ID NO: 4) (Db = mouse RANKL):

```
;  INFORMATION FOR SEQ ID NO:  11:
;    SEQUENCE CHARACTERISTICS:
;      LENGTH:  294 amino acids
;      TYPE:  amino acid
;      TOPOLOGY:  linear
;    MOLECULE TYPE:  protein
US-08-996-139-11

  Query Match             92.8%;  Score 1554;  DB 3;  Length 294;
  Best Local Similarity   99.7%;  Pred. No. 7.7e-145;
  Matches  293;  Conservative    0;  Mismatches    1;  Indels    0;  Gaps    0;

Qy         23 GVPHEGPLHPAPSAPAPAPPPAASRSMFLALLGLGLGQVVCSIALFLYFRAQMDPNRISE 82
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db          1 GVPHEGPLHPAPSAPAPAPPPAASRSMFLALLGLGLGQVVCSIALFLYFRAQMDPNRISE 60

Qy         83 DSTHCFYRILRLHENAGLQDSTLESEDTLPDSCRRMKQAFQGAVQKELQHIVGPQRFSGA 142
              |||||||||||||||| ||||||||||||||||||||||||||||||||||||||||||||
Db         61 DSTHCFYRILRLHENADLQDSTLESEDTLPDSCRRMKQAFQGAVQKELQHIVGPQRFSGA 120

Qy        143 PAMMEGSWLDVAQRGKPEAQPFAHLTINAASIPSGSHKVTLSSWYHDRGWAKISNMTLSN 202
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        121 PAMMEGSWLDVAQRGKPEAQPFAHLTINAASIPSGSHKVTLSSWYHDRGWAKISNMTLSN 180

Qy        203 GKLRVNQDGFYYLYANICFRHHETSGSVPTDYLQLMVYVVKTSIKIPSSHNLMKGGSTKN 262
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        181 GKLRVNQDGFYYLYANICFRHHETSGSVPTDYLQLMVYVVKTSIKIPSSHNLMKGGSTKN 240

Qy        263 WSGNSEFHFYSINVGGFFKLRAGEEISIQVSNPSLLDPDQDATYFGAFKVQDID 316
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        241 WSGNSEFHFYSINVGGFFKLRAGEEISIQVSNPSLLDPDQDATYFGAFKVQDID 294
```

Human RANK ligand shares 83% nucleotide and 84% amino acid identity with murine RANK ligand (column 22, full paragraph 1).

Human or murine RANKL is a polypeptide comprising an analog, derivative, conserved variant, or fragment of SEQ ID NO: 2 or SEQ ID NO: 4 in the absence of evidence to the contrary.

Anderson also discloses monoclonal antibodies against RANKL and their use in an ELISA (Example 10).

The present claims are directed to an antibody produced by a process. The burden is upon the applicants to establish a patentable distinction between the claimed antibody and Anderson's monoclonal antibodies against RANKL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10, 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (A) as applied to claim 10 above and further in view of Kimball (X).

Anderson teaches monoclonal antibodies that bind mouse and human RANKL and their use in an ELISA, as discussed above. Anderson does not teach such antibodies labeled with alkaline phosphatase.

Kimball teaches that alkaline phosphatase is frequently used for coupling to highly specific antibodies for use in an ELISA (Section 5.9, page 101-102, and Figure 5.20). Kimball does not teach monoclonal antibodies that bind mouse and human RANKL and their use in an ELISA.

However, it would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to make monoclonal antibodies that bind mouse and human RANKL and use them in an ELISA, as taught by Anderson, and to modify that teaching by coupling the antibodies to alkaline phosphatase, as taught by Kimball, with a reasonable expectation of success. One of ordinary skill in the art would be motivated to make this modification because alkaline phosphatase is frequently used for coupling to highly specific antibodies for use in an ELISA. The invention is prima facie obvious over the prior art.

Conclusion

No claims are allowable.

ANY INQUIRY CONCERNING THIS COMMUNICATION OR EARLIER COMMUNICATIONS FROM THE EXAMINER SHOULD BE DIRECTED TO DAVID S. ROMEO WHOSE TELEPHONE NUMBER IS (571) 272-0890. THE EXAMINER CAN NORMALLY BE REACHED ON MONDAY THROUGH FRIDAY FROM 7:30 A.M. TO 4:00 P.M. IF ATTEMPTS TO REACH THE EXAMINER BY TELEPHONE ARE UNSUCCESSFUL, THE EXAMINER'S SUPERVISOR, BRENDA BRUMBACK, CAN BE REACHED ON (571)272-0961.

IF SUBMITTING OFFICIAL CORRESPONDENCE BY FAX, APPLICANTS ARE ENCOURAGED TO SUBMIT OFFICIAL CORRESPONDENCE TO THE FOLLOWING TC 1600 BEFORE AND AFTER FINAL RIGHTFAX NUMBERS:

BEFORE FINAL (703) 872-9306
AFTER FINAL (703) 872-9307

CUSTOMERS ARE ALSO ADVISED TO USE CERTIFICATE OF FACSIMILE PROCEDURES WHEN SUBMITTING A REPLY TO A NON-FINAL OR FINAL OFFICE ACTION BY FACSIMILE (SEE 37 CFR 1.6 AND 1.8).

FAXED DRAFT OR INFORMAL COMMUNICATIONS SHOULD BE DIRECTED TO THE EXAMINER AT (571) 273-0890.

ANY INQUIRY OF A GENERAL NATURE OR RELATING TO THE STATUS OF THIS APPLICATION OR PROCEEDING SHOULD BE DIRECTED TO THE GROUP RECEPTIONIST WHOSE TELEPHONE NUMBER IS (703) 308-0196.

DAVID ROMEO
PRIMARY EXAMINER
ART UNIT 1647

DSR
DECEMBER 9, 2004